AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for forming a nanocomposite material, the method comprising:

providing a molten material;

providing a nano-sized material, said nano-sized material being substantially inert with respect to said molten material;

introducing said nano-sized material into said molten material;

dispersing said nano-sized material within said molten material ~~using at least one dispersion technique selected from the group consisting of~~ by ~~a.~~ agitating said molten material using ultrasonic energy to disperse said nano-sized material within said molten material; and

~~b. introducing at least one active element into said molten material to enhance wetting of said nano-sized material by said molten material; and~~

~~c. coating said nano sized material with a wetting agent to promote wetting of said molten metal on said nano-sized material; and~~

solidifying said molten material to form a solid nanocomposite material, said nanocomposite material comprising a dispersion of said nano-sized material within a solid matrix.

2. (Currently Amended) The method of claim ~~1~~ 64, wherein introducing said at least one active element comprises introducing a material selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur, and mixtures thereof.

3. (Currently Amended) The method of claim ~~1~~ 64, wherein introducing said at least one active element comprises introducing at least 0.01 weight percent of said active element into said molten material.

4. (Original) The method of claim 1, wherein providing said molten material comprises providing at least one metal selected from the group consisting of iron, copper, aluminum, nickel, molybdenum, titanium, tin, and mixtures thereof.

5. (Original) The method of claim 1, wherein providing said nano-sized material comprises providing at least one of a ceramic, an intermetallic, and a metal.

6. (Original) The method of claim 5, wherein providing said ceramic comprises providing an oxide.

7. (Original) The method of claim 6, wherein said oxide comprises at least one of aluminum, yttrium, zirconium, and cerium.

8. (Original) The method of claim 5, wherein providing said ceramic comprises providing at least one of a carbide, a nitride, and a boride.

9. (Original) The method of claim 5, wherein providing said intermetallic comprises providing an intermetallic comprising a silicide.

10. (Original) The method of claim 5, wherein providing a metal comprises providing a metal comprising tungsten.

11. (Original) The method of claim 1, wherein providing said nano-sized material comprises providing a nano-sized material wherein at least about 50 percent by volume of said nano-sized material has a length in at least one dimension of less than about 100 nm.

12. (Original) The method of claim 11, wherein said length in said at least one dimension is less than about 30 nm.

13. (Original) The method of claim 1, wherein providing said nano-sized material comprises providing material comprising at least one of spheres, rectangular prisms, cubes, rods, tubes, and plates.

14. (Original) The method of claim 13, wherein at least a portion of said spheres is hollow.

15. (Currently Amended) The method of claim ~~1~~ 65, wherein coating said nano-sized material with a wetting agent comprises coating said nano-sized material with a coating material comprising one of titanium, zirconium, yttrium, magnesium, hafnium, and mixtures thereof.

16. (Original) The method of claim 15, wherein said coating material comprises one of a ceramic, an intermetallic, and a metal.

17. (Currently amended) The method of claim ~~1~~ 65, wherein coating said nano-sized material comprises coating said nano-sized material with a layer having a thickness of at least a monolayer of said wetting agent.

18. (Original) The method of claim 1, wherein agitating said molten material using ultrasonic energy comprises using ultrasonic energy having a frequency in the range from about 10 kHz to about 40kHz.

19. (Original) The method of claim 18, wherein said frequency is in the range between about 20kHz and about 30 kHz.

20. (Original) The method of claim 1, wherein said dispersion of said nano-sized particles comprises an average inter-particle spacing of less than about 100 nm.

21. (Original) The method of claim 20, wherein said average inter-particle spacing is in the range from about 1 nm to about 100 nm.

22. (Original) The method of claim 21, wherein said average interparticle spacing is in the range from about 1 nm to about 50 nm.

23. (Original) The method of claim 1, wherein solidifying said molten material comprises one of

directionally solidifying to form a directionally solidified solid matrix; and

forming a single crystal solid matrix.

24. (Original) The method of claim 1, wherein introducing said nano-sized material comprises introducing said nano-sized material in an amount of up to about 40 volume percent into said molten material.

25. (Original) The method of claim 24, wherein introducing said nano-sized material comprises introducing said nano-sized material in an amount of up to about 5 volume percent into said molten material.

26. (Previously Presented) A method for forming a nanocomposite material, the method comprising:

providing a molten material;

providing a nano-sized material, said nano-sized material being substantially inert with respect to said molten material;

introducing said nano-sized material into said molten material;

dispersing said nano-sized material within said molten material, wherein dispersing comprises the steps of

a. agitating said molten material using ultrasonic energy to disperse said nano-sized material within said molten material, and

b. introducing into said molten material at least one active element selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur, and mixtures thereof, to enhance wetting of said nano-sized material by said molten material; and

solidifying said molten material to form a solid nanocomposite material, said nanocomposite material comprising a dispersion of said nano-sized material within a solid matrix, said dispersion comprising an average inter-particle spacing of less than about 100 nm.

27. (Previously Presented) A method for forming a nanocomposite material, the method comprising:

providing a molten material;

providing a nano-sized material, said nano-sized material being substantially inert with respect to said molten material;

introducing said nano-sized material into said molten material;

dispersing said nano-sized material within said molten material, wherein dispersing comprises the steps of

a. agitating said molten material using ultrasonic energy to disperse said nano-sized material within said molten material,

b. coating said nano-sized material with a wetting agent comprising one of titanium, zirconium, yttrium, magnesium, hafnium, and mixtures thereof, to promote wetting of said molten metal on said nano-sized material; and

solidifying said molten material to form a solid nanocomposite material, said nanocomposite material comprising a dispersion of said nano-sized material within a solid matrix, said dispersion comprising an average inter-particle spacing of less than about 100 nm.

28. (Previously Presented) A method for forming a nanocomposite material, the method comprising:

providing a molten material;

providing a nano-sized material, said nano-sized material being substantially inert with respect to said molten material;

introducing said nano-sized material into said molten material;

dispersing said nano-sized material within said molten material, wherein dispersing comprises the steps of

a. agitating said molten material using ultrasonic energy to disperse said nano-sized material within said molten material, and

b. introducing into said molten material at least one active element selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur, and mixtures thereof, to enhance wetting of said nano-sized material by said molten material, and

c. coating said nano-sized material with a wetting agent comprising one of titanium, zirconium, yttrium, magnesium, hafnium, and mixtures thereof, to promote wetting of said molten metal on said nano-sized material; and

solidifying said molten material to form a solid nanocomposite material, said nanocomposite material comprising a dispersion of said nano-sized material within a solid matrix, said dispersion comprising an average inter-particle spacing of less than about 100 nm.

29. (Withdrawn) An article manufactured by a method, the method comprising

providing a nanocomposite material, wherein providing said nanocomposite material comprises

providing a molten material;

providing a nano-sized material, said nano-sized material being substantially inert with respect to said molten material;

introducing said nano-sized material into said molten material;

dispersing said nano-sized material within said molten material using at least one dispersion technique selected from the group consisting of

agitating said molten material using ultrasonic energy to disperse said nano-sized material within said molten material,

introducing at least one active element into said molten material to enhance wetting of said nano-sized material by said molten material, and

coating said nano-sized material with a wetting agent to promote wetting of said molten metal on said nano-sized material;

solidifying said molten material to form a solid nanocomposite material, said nanocomposite material comprising a dispersion of said nano-sized material within a solid matrix; and

forming said nanocomposite material into said article.

30. (Withdrawn) The article of claim 29, wherein said at least one active element comprises a material selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur, and mixtures thereof.

31. (Withdrawn) The article of claim 29, wherein said molten material comprises at least one metal selected from the group consisting of iron, copper, aluminum, nickel, molybdenum, titanium, tin, and mixtures thereof.

32. (Withdrawn) The article of claim 29, wherein said nano-sized material comprises at least one of a ceramic, an intermetallic, and a metal.

33. (Withdrawn) The article of claim 29, wherein at least about 50 percent by volume of said nano-sized material has a length in at least one dimension of less than about 100 nm.

34. (Withdrawn) The article of claim 33, wherein said length in said at least one dimension is less than about 30 nm.

35. (Withdrawn) The article of claim 29, wherein said dispersion of said nano-sized particles comprises an average inter-particle spacing of less than about 100 nm.

36. (Withdrawn) The article of claim 29, wherein said solid matrix comprises one of a directionally solidified material and a single crystal material.

37. (Withdrawn) An article comprising:

a nanocomposite material, said nano composite material comprising a dispersion of nano-sized material within a solid matrix, said dispersion having a size distribution wherein a size range of said distribution is less than about 20% of a mean particle size of said distribution.

38. (Withdrawn) The article of claim 37, wherein said size range is less than about 10% of said mean particle size of said distribution.

39. (Withdrawn) The article of claim 37, wherein said matrix comprises at least one active element selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur.

40. (Withdrawn) The article of claim 37, wherein said matrix comprises at least one metal selected from the group consisting of iron, copper, aluminum, nickel, molybdenum, titanium, tin, and mixtures thereof.

41. (Withdrawn) The article of claim 37, wherein said nano-sized material comprises at least one of a ceramic, an intermetallic, and a metal.

42. (Withdrawn) The article of claim 37, wherein said nano-sized material further comprises a coating.

43. (Withdrawn) The article of claim 42, wherein said coating comprises one of a ceramic, an intermetallic, and a metal.

44. (Withdrawn) The article of claim 37, wherein said dispersion of said nano-sized particles comprises an average inter-particle spacing of less than about 100 nm.

45. (Withdrawn) The article of claim 37, wherein said matrix comprises one of a directionally solidified matrix and a single crystal solid matrix.

46. (Withdrawn) The article of claim 37, wherein said nano-sized material is present in said nanocomposite material in an amount of up to about 40 volume percent into said molten material.

47. (Withdrawn) An article comprising:

a nanocomposite material, wherein said nanocomposite material comprises

a matrix having a microstructure selected from the group consisting of a directionally solidified microstructure and a single crystal microstructure, and

a dispersion of nano-sized material within said matrix.

48. (Withdrawn) The article of claim 47, wherein said matrix comprises at least one active element selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur.

49. (Withdrawn) The article of claim 47, wherein said matrix comprises at least one metal selected from the group consisting of iron, copper, aluminum, nickel, molybdenum, titanium, tin, and mixtures thereof.

50. (Withdrawn) The article of claim 47, wherein said nano-sized material comprises at least one of a ceramic, an intermetallic, and a metal.

51. (Withdrawn) The article of claim 47, wherein said nano-sized material further comprises a coating.

52. (Withdrawn) The article of claim 51, wherein said coating comprises one of a ceramic, an intermetallic, and a metal.

53. (Withdrawn) The article of claim 47, wherein said dispersion of said nano-sized particles comprises an average inter-particle spacing of less than about 100 nm.

54. (Withdrawn) The article of claim 47, wherein said matrix comprises one of a directionally solidified matrix and a single crystal solid matrix.

55. (Withdrawn) The article of claim 47, wherein said nano-sized material is present in said nanocomposite material in an amount of up to about 40 volume percent into said molten material.

56. (Withdrawn) An article comprising:

a nanocomposite material, said nanocomposite material comprising a dispersion of nano-sized material within a solidified matrix material, wherein said dispersion of nano-sized material has an average particle size of up to about 100 nm and an interparticle spacing of up to about 100 nm.

57. (Withdrawn) The article of claim 56, wherein said matrix comprises at least one active element selected from the group consisting of titanium, zirconium, yttrium, magnesium, hafnium, oxygen, sulfur.

58. (Withdrawn) The article of claim 56, wherein said matrix comprises at least one metal selected from the group consisting of iron, copper, aluminum, nickel, molybdenum, titanium, tin, and mixtures thereof.

59. (Withdrawn) The article of claim 56, wherein said nano-sized material comprises at least one of a ceramic, an intermetallic, and a metal.

60. (Withdrawn) The article of claim 56, wherein said nano-sized material further comprises a coating.

61. (Withdrawn) The article of claim 60, wherein said coating comprises one of a ceramic, an intermetallic, and a metal.

62. (Withdrawn) The article of claim 56, wherein said matrix comprises one of a directionally solidified matrix and a single crystal solid matrix.

63. (Withdrawn) The article of claim 56, wherein said nano-sized material is present in said nanocomposite material in an amount of up to about 40 volume percent into said molten material.

64. (New) The method of Claim 1, wherein providing said molten material comprises introducing at least one active element into said molten material to enhance wetting of said nano-sized material by said molten material.

65. (New) The method of Claim 1, wherein providing said nano-sized material comprises coating said nano-sized material with a wetting agent to promote wetting of said molten metal on said nano-sized material.